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Global Price Movements in Consumer Price Indices

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Standard symbols

The following symbols are used in Statistics Canada publications:

.	not available for any reference period
..	not available for a specific reference period
...	not applicable
0	true zero or a value rounded to zero
0^s	value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
p	preliminary
r	revised
x	suppressed to meet the confidentiality requirements of the *Statistics Act*
E	use with caution
F	too unreliable to be published
*	significantly different from reference category ($p < 0.05$)

Global Price Movements in Consumer Price Indices

by John Baldwin and Ryan Macdonald

This article in the *Economic Insights* series reports on recent global movements in consumer prices. This article is published as part of a program at Statistics Canada that examines Canada's performance in a global context.

Inflation raises the overall cost of living for consumers. This may come from ongoing price increases across commodities that moved in step with one another, or from disparate patterns with large increases in some commodities being accompanied by lesser increases (or even decreases) in others. Beginning in the mid-1990s, after 35 years of broadly based consumer price increases, the price dynamics of some types of goods prices began to change significantly.

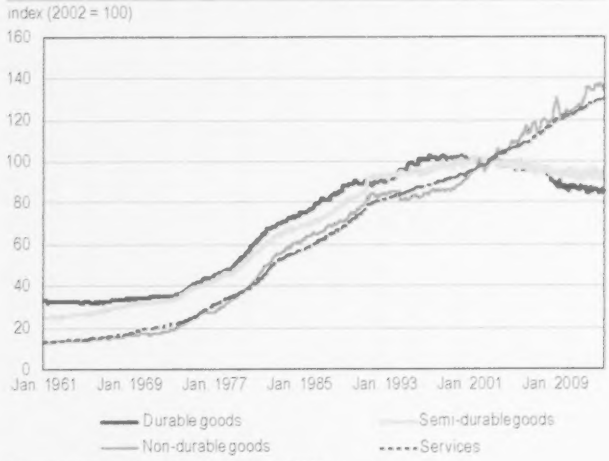
Disaggregating the Consumer Price Index

The Consumer Price Index (CPI) provides a number of aggregates that can be helpful for assessing how inflation has progressed differently across products. Among these is one that groups products according to physical longevity. Products are grouped into services, non-durable goods (items that are consumed almost immediately, such as food and energy), semi-durable goods (items that typically last up to 18 months, such as clothing and shoes), and durable goods (items that typically last more than 18 months, such as furniture, household appliances, and cars).

These CPI aggregations are available for Canada for the period from 1961 to the present. By using them, it is possible to examine price inflation for broad product groups over more than half a century. Doing so reveals a remarkable change in consumer price patterns beginning in the middle of the 1990s (Table 1 and Chart 1).

Between the late 1960s and the mid-1990s, prices for all major product groups in Canada increased. In the mid-1990s, the prices of durable goods in aggregate stopped rising. This was followed soon thereafter by a peaking of prices of semi-durable goods. By 2000, deflation in durable and semi-durable goods occurred. At the same time, prices for non-durable goods began rising more rapidly. Overall price increases between January 2000 and January 2013 were the result of price increases for non-durable goods and services outweighing the effect of deflation on the prices of durable and semi-durable goods.

Chart 1
Consumer price indices, Canada, 1961 to 2013



Source: Statistics Canada, CANSIM table 329-0020

All regions of Canada affected

Between January 2000 and January 2013, all regions in Canada had the same pattern of deflation in durables and semi-durables coupled with inflation in non-durables and services, although the magnitude of the changes varied according to the province or territory.

Table 1 compares average inflation rates for the period from January 1985 to January 1995 with average inflation rates for the period from January 2000 to January 2013 in order to illustrate the magnitude of the change in the inflation components.[1] It is not uncommon to find a deceleration of durable goods inflation in excess of 4 percentage points, a deceleration of semi-durable goods inflation in excess of 3 percentage points, or an increase in non-durables inflation of 1 percentage point. Inflation in services prices tended to decelerate between the first and second periods, but remained positive.

Across provinces and territories, the components change in the same manner: durables (e.g., cars, household appliances) and semi-durables (e.g., clothing) tend to move from making a positive contribution to making a negative contribution to overall inflation; and the inflation rate for non-durables (e.g., food, energy) rises.

The reduction in prices of durable goods relative to prices of other product groups after the mid-1990s accentuated a previous trend. From the late 1960s to the mid-1990s, durable goods prices rose less rapidly than those of all other categories.

This was likely the result of relatively higher productivity growth in durables.[2] After the mid-1990s, the pace of this relative price shift accelerated as the absolute price of durables declined.

Table 1
Average inflation in the All-items Consumer Price Index (CPI) and aggregates, Canada, provinces and territories

	All-items CPI	Durable goods	Semi-durable goods	Non-durable goods	Services
	average of year-to-year monthly inflation rates, percent change				
January 2000 to January 2013					
Canada	2.1	-1.3	-0.5	3.4	2.6
Newfoundland and Labrador	2.2	-1.1	-0.4	3.3	2.8
Prince Edward Island	2.5	-1.0	0.2	4.6	2.2
Nova Scotia	2.4	-1.1	-0.1	4.2	2.5
New Brunswick	2.2	-1.1	-0.3	3.8	2.4
Quebec	2.0	-1.1	-0.3	3.3	2.3
Ontario	2.1	-1.5	-0.8	3.5	2.7
Manitoba	1.9	-1.0	-0.4	3.1	2.5
Saskatchewan	2.3	-1.2	-0.2	3.2	3.3
Alberta	2.6	-1.3	-0.4	3.6	3.6
British Columbia	1.7	-1.2	0.0	2.9	2.0
Whitehorse, Yukon	1.9	-1.3	-0.2	3.1	2.4
Yellowknife, Northwest Territories	2.2	-1.3	0.1	3.8	2.5
January 1985 to December 1995					
Canada	3.4	2.8	3.1	2.9	4.1
Newfoundland and Labrador	2.9	2.8	3.0	2.5	3.4
Prince Edward Island	3.0	2.9	2.9	2.8	3.5
Nova Scotia	3.1	2.9	2.8	3.0	3.5
New Brunswick	3.1	2.7	2.8	2.8	3.7
Quebec	3.3	2.7	3.5	2.7	4.0
Ontario	3.5	2.8	3.0	2.7	4.4
Manitoba	3.6	2.9	3.4	3.6	3.9
Saskatchewan	3.4	3.0	3.3	4.1	3.2
Alberta	3.2	2.8	2.7	3.2	3.5
British Columbia	3.5	2.7	3.0	3.4	3.9
Whitehorse, Yukon	3.1	2.9	2.8	2.9	3.5
Yellowknife, Northwest Territories	3.5	2.5	2.7	3.5	4.0

Source: Statistics Canada, authors' calculations.

1. The period from January 1985 to December 1995 and the period from January 2000 to January 2013 shown in Table 1 are chosen in order to cover periods of rising and then falling durables and semi-durables prices. These years include periods of both strong and weak aggregate demand, as well as the implementation of the Bank of Canada's new inflation target regime. The length of each period is based on a desire to examine periods before and after the peaks in durables and non-durables prices, not on a statistical assessment of the exact point where the changes occurred.
2. In competitive markets, productivity growth reduces output-price growth. By moderating the rate of inflation in outputs, productivity growth facilitates real-income growth (income growth above the rate of inflation) and raises living standards (See Baldwin, Durand, and Hosein 2001). Manufacturing is one of the industries with the strongest productivity growth, and so its relatively stronger productivity performance means that its prices do not increase as rapidly (See Baldwin and Macdonald 2009). As a result, the relative price of manufactured products (such as durables and semi-durables) tends to decline.

Inflation changes not confined to Canada

International comparisons are challenging because CPIs across countries do not include exactly the same groups of goods and services in their aggregates, and because different countries publish slightly different aggregates. Nevertheless, an international comparison of CPI aggregates can be made of groupings that are closely related (Table 2).[3] To facilitate the international comparison, the non-durables category is split into food, energy, and "other," because the European data are structured in this way. Since the data for Europe begin in 1997,[4] no comparison is made to an earlier period.

Table 2
Average inflation for components by country, January 2000 to January 2013

	Durables	Semi-durables	Non-durables			Services
			Excluding food and energy	Energy	Food	
	average of year-to-year monthly inflation rates, percent change					
North America						
Canada	-1.3	-0.5	2.8	5.2	2.8	2.6
United States[1]	-0.8	-0.3	..	7.4	2.7	2.8
Europe						
European Union[2]	-0.5	0.1	1.9	5.7	2.9	2.5
Austria	0.2	0.7	2.0	4.8	2.5	2.3
Belgium	0.1	0.7	2.2	6.2	2.6	2.1
Bulgaria	-0.9	1.9	5.7	8.6	6.6	6.7
Croatia[3]	-0.7	0.6	3.6	5.6	3.7	2.5
Cyprus	-2.2	-1.1	2.5	10.2	4.4	2.8
Czech Republic[3]	-3.4	-2.1	2.2	5.6	2.9	3.6
Denmark	-0.7	0.2	1.9	4.4	2.4	2.9
Estonia[4]	-3.7	2.9	3.3	9.0	4.8	4.4
Finland	-1.2	0.5	1.4	5.3	2.3	2.7
France	-1.0	1.0	1.6	4.7	2.5	2.1
Germany	-0.4	0.4	1.7	5.7	2.1	1.5
Greece	0.0	2.1	2.1	8.8	3.4	3.1
Hungary[3]	-0.8	1.8	5.1	8.2	6.3	5.4
Iceland	4.7	4.2	7.1	8.6	5.5	6.2
Ireland	-1.5	-3.6	1.2	6.5	2.3	3.6
Italy	1.4	1.3	2.2	5.1	2.7	2.4
Latvia	-2.0	0.3	4.2	8.9	6.7	4.6
Lithuania	-3.6	-2.0	2.6	7.7	3.8	3.7
Luxembourg	1.1	0.9	2.2	6.4	3.7	2.8
Malta	0.0	-0.3	2.2	7.6	3.6	2.9
Netherlands	0.1	0.2	1.6	5.8	2.3	2.7
Norway	-0.2	-1.9	2.6	5.4	1.9	3.0
Poland	-1.0	-1.0	3.5	6.8	3.9	3.9
Portugal	0.9	0.0	1.5	5.8	2.2	3.2
Romania[4]	4.9	5.5	7.9	13.8	8.7	9.2
Slovakia	-3.3	1.2	3.4	10.4	3.8	6.4
Slovenia[3]	-0.6	1.5	3.3	7.6	4.8	4.7
Spain	0.2	1.3	1.7	6.1	3.4	3.2
Sweden	-1.7	0.4	1.8	4.7	2.0	2.0
Switzerland[5]	-2.4	0.2	-1.2	3.7	0.1	0.9
Turkey	17.7	17.0	17.7	25.2	20.8	20.4
United Kingdom	-1.5	-2.8	1.8	6.5	3.4	3.6

Notes:
Authors' calculations.
1. No series exists for "semi-durables" under the U.S. Bureau of Labor Statistics classification system. The series "Apparel" is used here as a proxy. All U.S. inflation series are for "All urban consumers."
2. Eurostat aggregations based on industrial durables, industrial semi-durables, industrial non-durables, Processed food including alcohol and tobacco, and energy. A description of the items included in each category can be found in the European Central Bank (ECB) document *Harmonised Indices of Consumer Prices*, November 2011.
3. Start period is December 2000.
4. Start period is December 2001.
5. Start period is December 2005.

Sources: Statistics Canada, U.S. Bureau of Labor Statistics, and Eurostat.

3. Data for Europe come from Eurostat's Harmonised CPI program; data for the United States come from the U.S. Bureau of Labor Statistics; data for Canada come from Statistics Canada's CANSIM database. Because exact matches cannot be made between product groups, there is a degree of imprecision in assessing growth rates across statistical systems. However, it is possible to make comparisons within statistical systems, as well as to examine the pattern that emerges in each country and then to compare this general pattern across nations.
4. Countries continued to join the Harmonised CPI program through the 2000s. When a country's data start after January 2000, it is so indicated in the table.

The general pattern across North America and most of Europe is one of inflation in services and non-durables, coupled with deflation in durables. The inflation-deflation pattern in semi-durables prices is found less consistently, but semi-durables growth is generally weaker than price changes in services and non-durables. Even for countries with higher inflation rates, durables inflation is noticeably weaker than non-durables inflation. For example, in Turkey, durables inflation is 7.5 percentage points lower than energy inflation. In Canada and the United States, the differences are 6.5 and 8.2 percentage points respectively, and this is similar to the differences observed in many other nations. CPI data show an international divergence in the trajectories of prices for durables and semi-durables relative to prices for food, energy, and services.

An international source?

If the inflation-deflation pattern were confined to Canada, the source might be an idiosyncratic, country-specific event, such as the appreciation of the Canadian dollar. However, the inflation-deflation pattern is observed across many Western economies, pointing to the possibility of a more systemic and large-scale event. A possibility is the emergence of a set of developing nations—the BRIC[5] countries—in the mid 1990s. There is evidence that China's growth has influenced global markets for commodities[6] and financial products,[7] the global return on capital,[8] and, by extension, the Canadian economy,[9] and that India has the potential to follow suit.[10] The increased importance of China and India has contributed to an increase in demand for food, energy, and other raw materials and decreased the relative prices of many manufactured products as these countries increased production using factors with relatively low international input costs. Their emergence integrated billions of people into global markets, and their production raised the global supply of manufactured outputs.

CPI inflation and special aggregates

The inflation-deflation pattern among the components of the CPI creates a situation where the trend growth rates of some of the most volatile components of CPI (food and energy) have been above those of other components. As a result, these components have been a source of long-run increases in the overall price level. Traditionally, excluding these components from the overall price index, for purposes of analysis, has been viewed as acceptable practice if volatility is being removed from the index and their long-term movements did not diverge from those of other commodities. Increases in one period would be offset by subsequent declines. This led to the creation of special inflation measures that dissected and re-aggregated CPI components on the basis of volatility criteria.[11]

Inflation measures designed to reduce the influence of highly volatile items through their exclusion include the All-items CPI excluding food and energy and the Bank of Canada's Core CPI.[12]

In the current situation, however, there is a persistent trend increase in the more volatile components (food and energy) and a persistent decline in a number of the lower-volatility goods (cars, household appliances, clothing). As a result, special re-aggregations like All-items CPI excluding food and energy will tend to show lower inflation than the All-items CPI.

The degree to which this occurs will depend on what is excluded. Measures that make a broader exclusion, such as All-items CPI excluding food and energy, will be affected to a greater extent than measures that make more targeted omissions, such as Core CPI. For example, between January 2000 and January 2013, the All-items CPI for Canada increased by an average of 2.1% while growth in the Core CPI averaged 1.8% and the CPI excluding food and energy increased at an average rate of 1.6%. The cumulative increase in the All-items CPI

5. The acronym *BRIC* refers to the countries Brazil, Russia, India, and China.
6. Francis (2007).
7. *Economist (2005a)*.
8. *Economist (2005b)*.
9. Macdonald (2007).
10. Francis and Winters (2008).
11. Discussions surrounding core inflation propose a number of methods for dealing with volatility. One widely discussed method is the exclusion of more volatile components. Other methods that receive less public attention, such as median product inflation, inverse volatility weighted inflation, and exponential smoothing, have been examined (See Laflèche and Armour 2006, Rich and Steindel 2005).
12. The Bank of Canada's core index excludes eight of the CPI's most volatile components (fruit, fruit preparations and nuts; vegetables and vegetable preparations; mortgage interest cost; natural gas; fuel oil and other fuels; gasoline; inter-city transportation; and tobacco products and smokers' supplies) as well as the effects of changes in indirect taxes on the remaining components. For additional information on the Core CPI, please consult the Bank of Canada website: http://www.bankofcanada.ca/rates/indicators/key-variables/inflation-control-target/

was 29.7%, 3.3 percentage points more than the cumulative increase in the Core CPI and 6.7 percentage points more than the cumulative increase in the CPI excluding food and energy. In the United States, the All-items CPI averaged 2.5% growth while the All-items CPI excluding food and energy averaged 2.0% growth. The cumulative increase in the All-items CPI for the United States was 36.4%, 6.9 percentage points more than the cumulative increase in the CPI excluding food and energy.[13]

All-items CPI measures the inflation rate

The inflation–deflation pattern found in the sub-components of the CPI can suggest stronger or weaker inflation depending on where emphasis is placed. Special measures of price changes in subcomponents of the CPI basket can be informative for analysis or for understanding the influences of highly volatile components on changes in the overall price level. However, going beyond the uses for which some special measures were intended may understate the degree to which the price level, as measured by the All-items CPI, is increasing over longer periods of time.[14]

13. The U.S. Federal Reserve uses a definition of *core inflation* different from the one produced in Canada: it uses an "All-items less food and energy" index as a measure of core inflation. For this purpose, the Federal Reserve is focussing more on the Personal Consumption Expenditure (PCE) deflator from the National Income and Product Accounts produced by the Bureau of Economic Analysis than on the CPI produced by the Bureau of Labor Statistics (See, for example, Rich and Steindel 2005). The PCE is similar to the CPI, but there are differences between the two indices in terms of product coverage, methodology, and weighting (See: McCully, Moyer, and Stewart 2007; Fixler and Jaditz 2002). In this paper, both the CPI and the CPI excluding food and energy are discussed because the focus of the article is consumer price indices.

14. The CPI is the most commonly discussed measure of inflation in Canada. Alternatives, such as the gross domestic product deflator or the consumption price index from the Canadian System of National Accounts, are also used in specific circumstances. But, overwhelmingly, the year-on-year change in the All-items CPI is employed as the measure of inflation. It is used in contract setting, as a monetary policy target, in the calculation of payments on real-return bonds, and is the index used to adjust pension outlays.

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